

The indicated horse-power required depends upon the mechanical efficiency, which is very high in this class of engine, varying at full load from 90 per cent for the smaller powers and 92 per cent for medium powers to 93 or even 94 per cent for the largest. Experiments have shown that with any particular engine the amount of power absorbed by friction is practically constant at all loads. If we plot indicated horse-power against brake horse-power, we get the diagram fig. 34, which shows how the

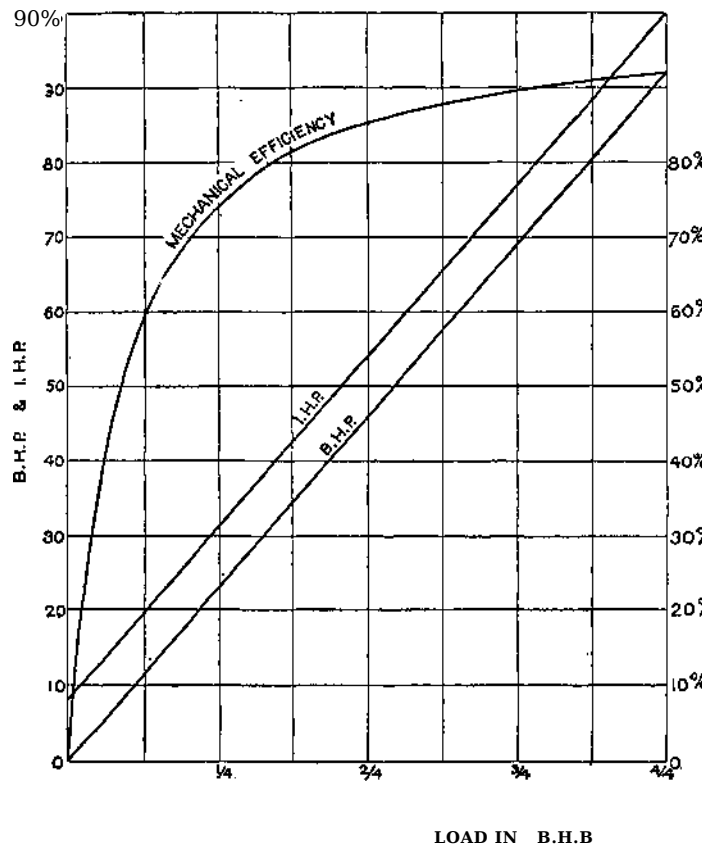


Fig. 34.—Mechanical Efficiency Curve

efficiency varies with the load on the engine. The line of indicated horse-power is parallel to the inclined brake horse-power line because of the constant difference mentioned above. The figure is drawn so that " 100 " represents the full load indicated horse-power.

Piston speeds vary from 500 to 750 ft. per minute for two-crank compound engines, and may reach 1000 ft. per minute for three-crank engines according to size. A three-crank engine with the cranks arranged at angles of 120° may have a higher speed than an

engine with two cranks opposite to each other, the stroke being the same in each case, as the rocking couples are relatively much less in amount.

Simple engines are suitable for pressures below 80 lb. per square inch